

Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 24-27 June 2005

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SUMMARY

The seventh consecutive aerial survey of common eiders and other waterbirds along the coastline of the Arctic Coastal Plain (ACP) of Alaska, including barrier islands, was conducted from 24 to 27 June 2005. Observations were made from an amphibious Cessna 206 (N61599) by pilot/observer and right seat observer. The study area, established when the survey was initiated in 1999, encompasses approximately 1,050 km of the Chukchi and Beaufort sea coastlines from Omalik Lagoon north and east to the Canadian border and an additional 190 and 325 linear kilometers, respectively, of barrier island habitats off Kasegaluk Lagoon and from Point Barrow to Demarcation Bay. Shorefast ice cover in 2005 was more extensive than 2004 in both the Chukchi and Beaufort seas. Ice free areas in the Beaufort Sea were especially limited and most barrier islands were accessible to terrestrial predators.

A total of 2,581 common eiders, including 1,121 indicated breeding pairs (pairs+single drakes), was observed in 2005. Totals and indicated breeding pairs were down 14.9 and 16.3 percent, respectively, from 2004 and down 5.0 and up 24.8 percent, respectively, from the long-term averages (1999-2005). The decline in total common eiders observed in 2005 occurred despite more extensive ice cover which is believed to either delay (short-stop) migrants or alter their routes. In previous years with extensive ice cover (i.e. 2002, 2004) increased numbers of common eiders were observed. In 2005 the proportions of total birds and indicated breeding pairs decreased along the Chukchi Sea coast and increased in the Beaufort Sea in comparison to 2004 (Dau and Larned 2004). Other primary waterbird species observed and their change in numbers from 2004 were: long-tailed duck 3,972 (+12.6%), glaucous gull 3,959 (-22.7%), surf scoter 3,220 (+108.7%), Pacific brant 1,843 (-52%), white-winged scoter 1,235 (+6.6%), king eider 1,013 (-56.5%), Canada goose (+37.6%), lesser snow goose 774 (+65.4%), greater scaup 602 (+47.5%), and northern pintail 553 (-26.4%). Yellow-billed loons (n=23) declined 54.9% from the 1999-2004 average of 51 birds.

INTRODUCTION

This report summarizes the seventh consecutive year of aerial survey efforts to estimate common eider population size and determine trends, demography, distribution and habitat conditions along the coastline of the Alaskan ACP (Dau and Taylor 2000a, 2000b, Dau and Anderson 2001, 2002, Dau and Hodges 2003, Dau and Larned 2004). The survey area is north and east from Omalik Lagoon along the Chukchi Sea to Point Barrow then east along the Beaufort Sea to the Canadian border (Figures 1 and 2). The objectives have been to estimate the annual size of the Alaska breeding common eider population along the ACP using indicated breeding pairs as the index and to determine trends in number, demographics and distribution. These data and other indices of population size (Suydam et al. 1997, 2000a, 2000b) will be useful for management of the species and for evaluating the potential impacts of on and offshore petroleum development and other activities in northern Alaska.

METHODS

This survey is timed to coincide with egg laying and early incubation when pair bonds are intact and males remain in the vicinity of breeding sites. Available literature summarized by Johnson and Herter (1989), subsequent studies and this survey were used to estimate breeding phenology and appropriate survey timing. Observations were made from an amphibious Cessna 206 flown at approximately 110 knots and an altitude of 45 meters ASL/AGL. Observations, made from both sides of the aircraft by the pilot/observer (left) and observer (right), were entered directly into onboard computers using remote microphones. As in previous surveys computers were interfaced with the aircraft Global Positioning System (GPS) to geo-reference observations. The survey area extended 1.6 km seaward of terrestrial habitats (i.e. mainland, peninsula and barrier island shorelines) when open water existed. Flight routes followed shorelines and included all island and peninsula habitats and near shore waters. Flight tracks were periodically checked on laptop computers using moving map programs to help ensure complete survey area coverage. Deviations were made to include larger flocks detected up to 3 km offshore. Flights were conducted in calm or light winds whenever possible and during mid-day to maximize sun-angle, reduce glare and increase the visibility of birds on the water. Increased flight time was required to adequately cover the survey area when survey conditions were not optimum.

The survey area includes 30 mainland shoreline segments and 22 islands or island groups (Figs. 1 and 2) identified on 1:250,000 scale topographic maps. Insular areas along the central Beaufort Sea coast were also identified on 1:63,360 scale topographic maps. Maps were consulted during the survey primarily to identify segment start and stop points. General observations on habitat, survey and ice conditions were voice recorded and the latter was compared to sea ice analyses prepared by the National Weather Service (Figure 3). Whenever possible, sex and age (i.e. adult or subadult) of single birds and composition of flocks were determined for waterfowl species. Flocks that could be identified as assemblages of single adult males or pairs were divided into singles and pairs as appropriate. Observations of common eiders and other species were summarized by survey segment (Tables 1 and 2) and for the total survey area (Table 3). The distribution, sex and age composition and numbers of common eiders were recorded by survey segment and summarized to estimate total population size (singles+2x pairs+birds in flocks) and the number of indicated breeding pairs (Tables 4 and 5).

STUDY AREA/CONDITIONS

Physical descriptions of individual survey segments and the following groupings of segments are described by Dau and Taylor (2000). Survey and ice conditions encountered in 2005 were:

Omalik Lagoon to Point Barrow (Segments 1-11)

Omalik Lagoon and Kasegaluk Lagoon south and west of Utukok Pass were ice free. The remainder of Kasegaluk Lagoon north to Icy Cape and from Icy Cape to the north end of Kasegaluk Lagoon was 20 and 80 percent ice covered, respectively. There was no shore-fast

ice from Omalik Lagoon to Pt. Lay and patchy, broken ice built to 3 km in width north to Utukok Pass. Mostly continuous shore-fast ice, 4-10 km wide, extended from Utukok Pass north to Barrow with the exception of 1.6 km off Wainwright Inlet and 0.8-1.6 km off the mouth of Peard Bay. Peard Bay was nearly 100 % ice covered with surface melt. Only large onshore lakes contained ice ($\leq 90\%$) and the tundra was snow free. Survey conditions were good with ceilings and visibility unlimited, ENE winds up to 10 knots and temperatures were 38 to 60°F.

Point Barrow to the Colville River Delta (Segments 12-18)

Shore fast ice with no visible open water was present seaward from Point Barrow to Cape Simpson. Elson Lagoon was closed pack ice with moderate surface melt as was Dease Inlet with the exception of 150 m open water along the east shore and approximately 40 m open around Tiny and Oarlock islands. Admiralty Bay was closed pack ice with open water at river mouths. Southern Smith Bay had 150 m of open water near areas of tide flats. Small areas of broken ice/open water were present at Cape Halkett and along the south side of Harrison Bay east to the Eskimo Islands. Kogru Inlet was closed pack ice with little surface melt. Eastward in Segment 17, open water along shorelines gradually increased from 0.4 to 2.5 km at Fish Creek. Colville River channels were ice free as was the coastline to 12-16 km offshore. Largest lakes were $\leq 90\%$ ice covered. Survey conditions were fair due to glare. Ceilings and visibility were unrestricted and initially calm winds became ENE 15-20 knots throughout the day. Temperatures increased from 40° to 50°F.

Colville River Delta to the Canning River Delta (Segments 18-21, 190-214)

Open water decreased from 6-7 km east of the Colville River Delta to closed pack with surface melt 8 km west of Oliktok Point. Simpson Lagoon was closed pack from Oliktok Point east becoming patchy broken ice/open water at Beechey Point. Gwydyr Bay was mostly ice free east to West Dock. Closed pack, shore fast ice was present north of barrier islands (Thetis to Stump) with 10-30 m of open water south of the islands (Thetis to Egg). Stump Island had approximately 0.4 km of open water to the south. The Prudhoe Bay shoreline had 0.4 km of open water with closed pack ice to the north. Niakuk islands to the Endicott Causeway was ice free approximately 6-7 km seaward with 100m of shorefast along the west shore of the causeway and closed pack to the east. Point Brower had 0.8 km of open water, otherwise Foggy Island Bay was 50% closed pack with broken ice/open water along the south shore. Mikkelsen Bay east to Flaxman Island was closed pack with surface melt. Flaxman Island to Brownlow Point was 50% open water. All barrier and other islands from the Midway Islands east to Flaxman Island had closed pack ice to the north and 10-30 m open water to the south. Survey conditions were fair with some glare, ceilings and visibility were unrestricted and initially calm winds increased to E 15-20 knots. Temperatures were 50-55°F.

Canning River Delta to the Canadian Border (Segments 22-29)

From Brownlow Point east to Anderson Point closed pack ice was present north of barrier islands and shorelines. Canning River lagoon was ice free except for the western 1 km (20%

ice cover) and east of the Canning River to Konganevik Point (50% ice cover). Camden Bay had 95% closed pack ice. From Anderson Point to Kaktovik, ice north of barrier islands increased from 0.4-1.6 km in width. Arey Lagoon was ice free west of the Canning River and 10% ice covered to the east. Kaktovik Lagoon was 80% ice covered versus 10% ice cover in Jago, Tapkaurak and Oruktalik, lagoons. Pokok Lagoon and Pokok Bay were 90% ice covered and Angun Lagoon was 80%. Beaufort Lagoon was 85% ice covered with some snow cover on the deltas of the Aichilik and Kongakut rivers. Demarcation Bay was 50-60% ice covered with surface melt. North of barrier islands and exposed shorelines from Kaktovik east to the Canadian border, ice was closed pack and shorefast except at the mouth of the Aichilik River where broken ice/open water extended up to 16 km seaward. Survey conditions were fair with some glare, ceilings and visibility were unrestricted and initially calm winds increased to E 15-20 knots. Temperature was 50°F.

RESULTS/DISCUSSION

Based on previous year's observations, the 2005 survey coincided with pair residency at breeding sites (i.e. late egg laying and early incubation) and data are appropriate for comparison to previous years.

A total of 2,581 common eiders, including 1,121 indicated breeding pairs, was observed in 2005 (Figures 1 and 2; Tables 3 and 4a-b). Total birds and indicated breeding pairs were down 14.9 and 16.3 percent, respectively, from the 2004 counts of 3,033 birds and 1,340 pairs. Total birds and indicated pairs in 2005 were down 5.0 and up 24.8 percent, respectively, from the 1999-2005 averages of $2,718 \pm 944$ (1SD, range 1,353-4,449) birds and 898 ± 260 (1SD, range 572-1,340) pairs. Number of common eiders observed and estimates of indicated breeding pairs increased in the three primary use areas (Table 5, Figure 4) with greatest proportional increases from the Canning River to Demarcation Bay (1,084 total birds, 42.0%; 377 indicated breeding pairs, 33.6% of total) (Tables 2, 4b and 5; Figure 4).

Flocked birds in 2005 totaled 998 (38.7% of total), which is proportionally comparable to 2004 (1,033 pairs, 34.1% of total observations). Number and composition of common eider flocks indicates adult males have predominated in six of seven years (Table 7). Only two subadult males (0.1% of total observations) were observed in 2005 versus 30 (1.3%) in 2004 and none in 2002 or 2003. Subadult males made up 1.3, 0.3 and 0.4 percent, respectively, of total observations in 1999, 2000 and 2001. Detectability of subadults is likely related to observer experience; nevertheless, the low number reported suggests that breeding adults predominate along the ACP.

Total numbers of common eiders observed, and to a lesser extent the number of indicated breeding pairs, appears to be primarily affected by ice conditions which may concentrate Canadian migrants during some years. The number of indicated breeding pairs is believed to be indicative of reproductive effort along the ACP of Alaska and although numbers have varied, the trend appears stable (Figure 4). Number and distribution of indicated breeding pairs of common eiders varied less than did total numbers from 1999-2005 (Table 5). To better understand the effects of changes in annual distribution it would be important to 1)

evaluate fidelity of individual pairs to breeding sites and 2), if individual pair distribution varies, how this relates to annual productivity. Flint et al. (2003) documented low productivity and recruitment of common eiders along the coast of the central Beaufort Sea suggesting the population would decline unless supplemented by immigration or infrequent years of high recruitment.

Primary potential causative factors affecting the distribution and abundance of common eiders along the ACP of Alaska require further investigation. In addition to the effects of ice distribution and the amount of open water available during migration, change in quality of nesting habitat appears important to common eiders. Preferred nesting sites are associated with driftwood, detritus and vegetation on barrier islands and peninsulas. Storm surges, wind and tide erode vegetation and alter the amount of available driftwood and detritus which in turn affects the suitability of breeding sites to nesting common eiders. Common eider distribution, abundance and demography are related to changes in habitat conditions hence, continuation of this survey will help document long-term patterns of use.

RECOMMENDATIONS

- 1) Continue annual aerial survey to quantify and monitor the distribution, abundance, demographics, and habitat use of the common eider population summering along the Alaska ACP.
- 2) When available, utilize ground survey data of birds and nests within the survey area to aid in refining survey timing and potentially provide air:ground visibility indices.
- 3) Investigate techniques, including aerial photography, to annually or periodically quantify the amount and describe the distribution of ground cover (i.e. vegetation, drift wood and detritus) important to nesting common eiders.

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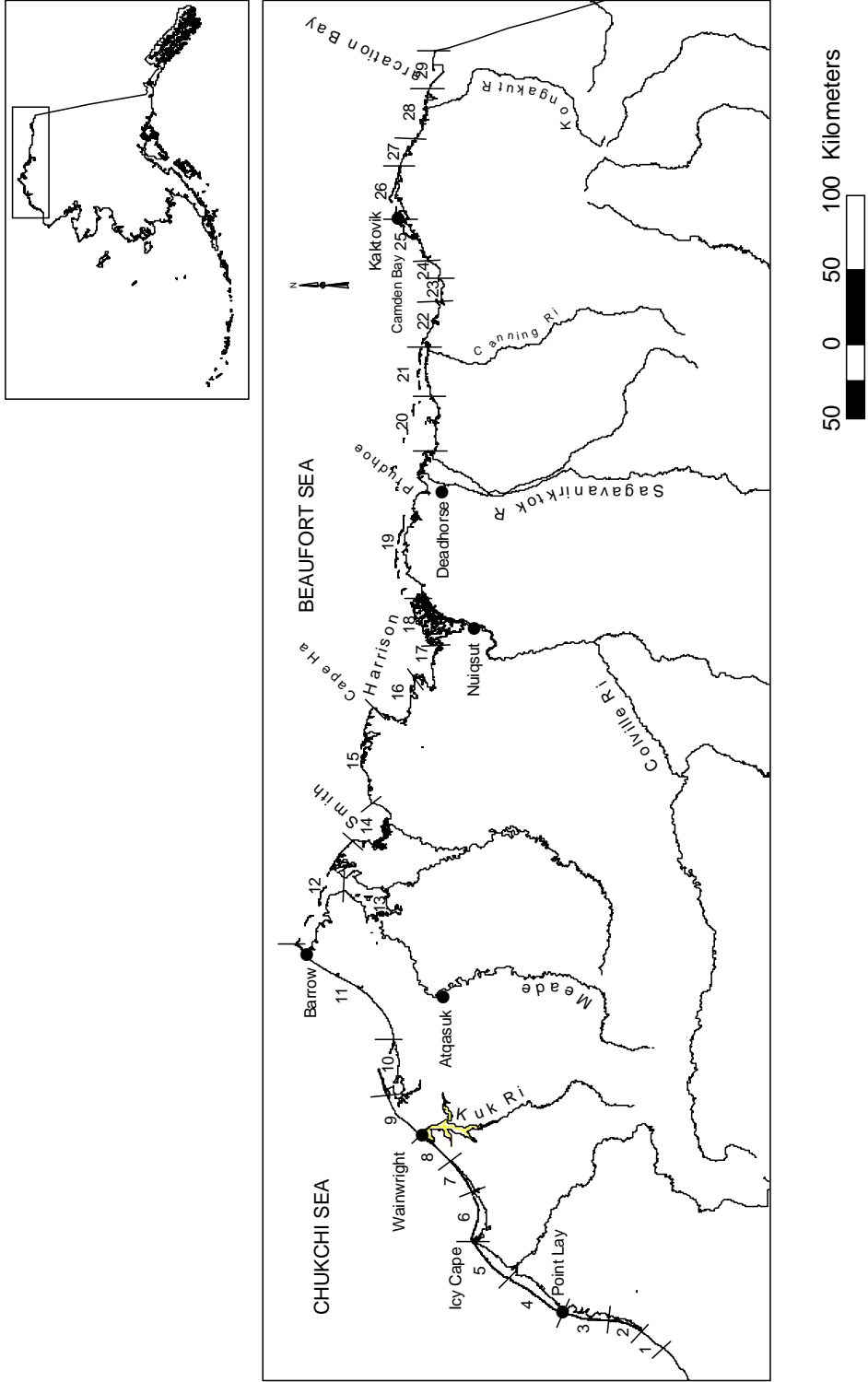


Fig. 1. Location of aerial survey segments searched for common eiders along the Arctic Coast, Alaska

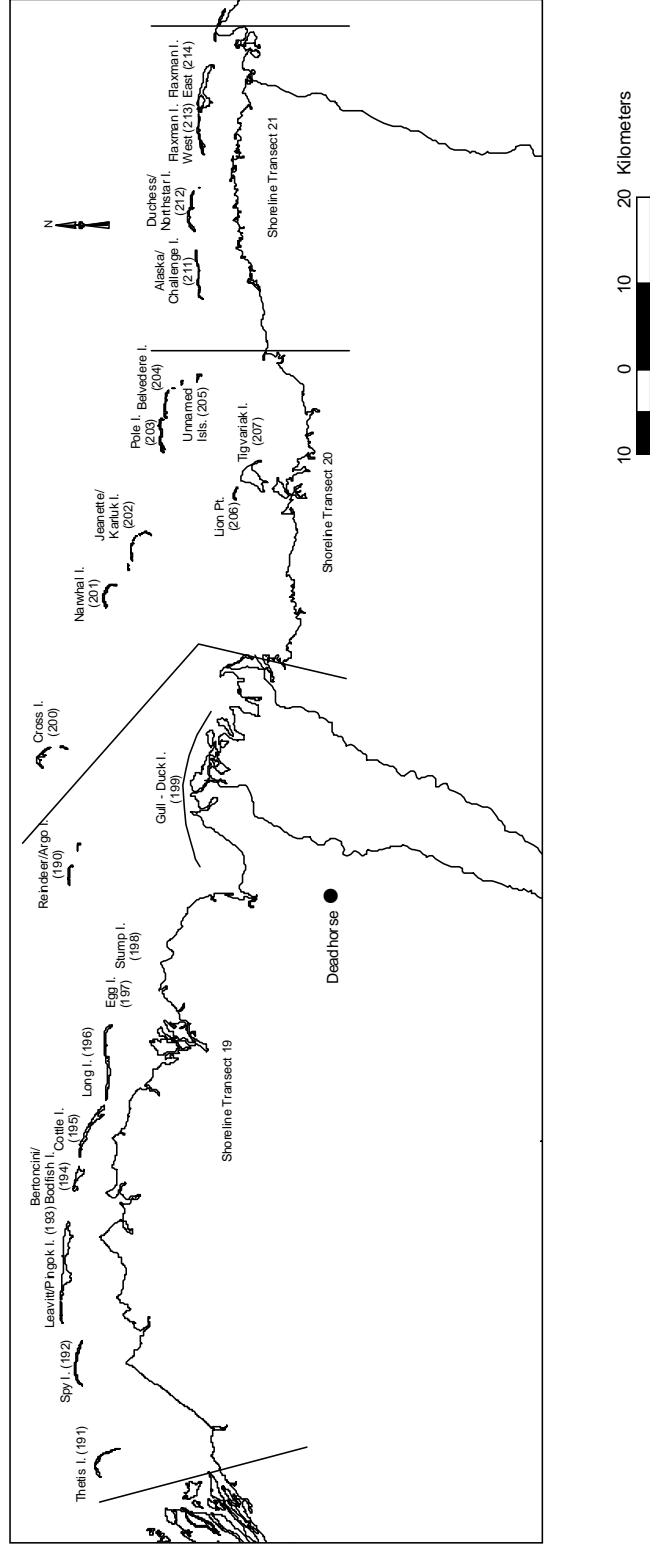
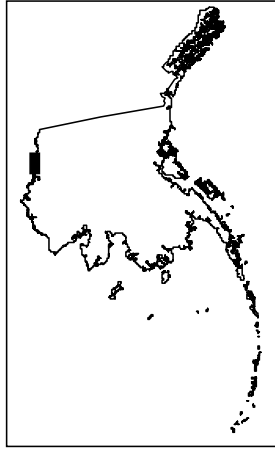


Fig. 2. Survey segments, including coastline and barrier islands, along the central Arctic Coastal Plain, Alaska.

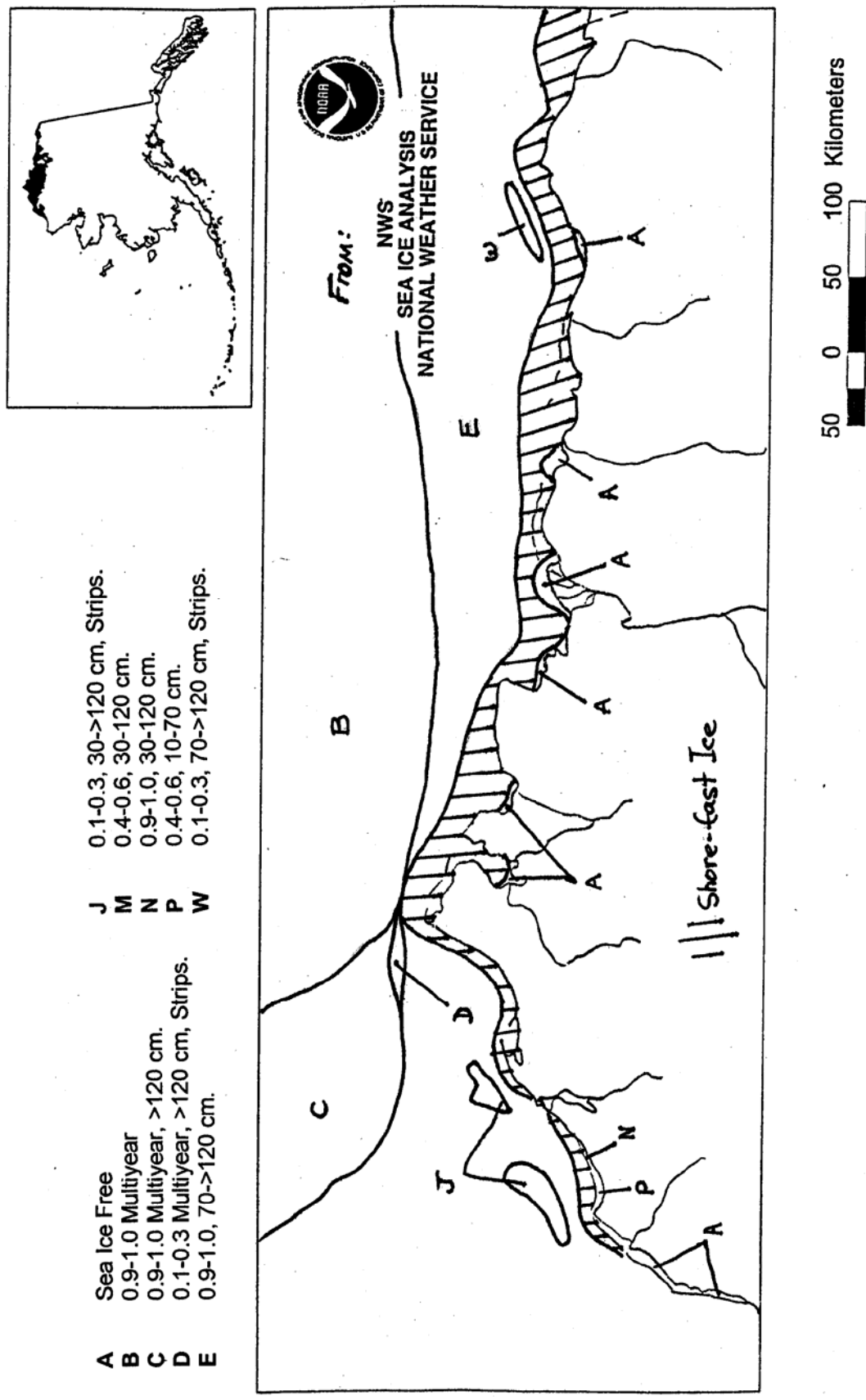


Figure 3. Sea ice conditions in late June along the Arctic Coastal Plain, 2005.

Table 1. Species totals by segment along barrier islands of the ACP, 24-27 June, 2005.

Species	Segment Number																				Total		
	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	211	212		213	214
ARTE			6		1				1	9			1						1				19
BLBR	5				10				6	25		15				20							81
CAGO				15	28													2					45
COEH ¹							2	1	1	5					1		1						11
COEI	1		11	3		2	11	18	65	361	17	12	16		1	15	41	2	52	10	3		641
GLGU	10	5	4	12		5	2	24	156	234	44	3	6	1	4	1	6			2	5	5	529
KIEI					2					223								2					227
LTDU				17	15	1	50	5		6	13	2	23			20	276						428
NOPI																		10					10
PALO				7		4	3		1	1							3	1			1		21
RBME										44		3	2				2						51
RTLO			5	1	2					5													13
SAGU					1					6													7
SNGO										352													352
SNOW										1											1	1	3
SUSC					5	380		10		153													548
TUSW										3													3
WWSC										7													7

¹ COEH = common eider hens in singles and flocks.

Table 2. Species totals by segment along ACP mainland shoreline, 24-27 June, 2005.

Species	Segment Number																												Total				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		29	181		
AMWI		2																													2		
ARTE	3	163	161	185	16	20	3	44		6		19		2				2	4								1		6		635		
BLBR			71	91	64	466	348			108		48	118	78	59	4	61	77	76	22	5					23			31	12	1762		
BLKI	3																														3		
BLSC		18	2																												35		
CAGO													2		582	152	2			5		4								2	749		
CEJV ²		1	1																												2		
COEH ¹		3	1	7	4	1	1			1										4	15	1				6	1		4		49		
COEI	13	70	24	221	198	40	92	2		80	2				2					18	44	401	158	61	138	75		72	167		1878		
COLO																														2	2		
GLGU	241	187	212	697	401	152	73	161	86	35	23	36	59	46	64	4	30	13	71	110	37	31	15	2	149	205	46	33	31	180	3430		
GRSC			42		50								10							80			30		170		70		150		602		
KIEH ¹		4	5				4			3			1								2	5									24		
KIEI	5	240	7	11		2	4					10	8	151	10	15	14			49	21	29	160			26	1		19	4	786		
LGSB			2																													2	
LTDU	188	509	301	1129	449		4	15	1	50		213	16	207	42					6	87	107	115	2	20	1	76		6		3544		
NOPI		383		21	7	2							39	2	15							4				2	4		35	29		543	
PAJA																		1	1						3							5	
PALO	5	3	8	4	15	13	11	5		7		4	4	4	5					12	12	7	10		5	1	6		3	1		145	
PIGU												1																				1	
RBME	15	11	56	10	129	10	13	12				1		2							4	6	11	7		3	19		40	95		444	
RTLO	18	8	5	10	8	1						1	1		5		1			2						2	4				2	68	
SAGU												51		1	20			2								2						76	
SMSH							2						4	2																		8	
SNGO	3	2	152	1		3		3						60						123		71		4								422	
SNOW			2	1							2																		1	3		12	
SPEI				5	4		2						7																			18	
STEH ¹		6																														6	
SUSC		7		7																													2672
TUSW		4		9	7	13	2				4		4	3	2		5	9	2	1	2						5		4	1	3	80	
WFGO	25	69	11		5	10							29	17	40	42	11	124	40					5	4	12				9	1	454	
WWSC	14	55	4	21																	30		169	4	93	55	35		254	494		1228	
YBLO		2		2	4	1	1	12		1																						23	

¹ COEH, KIEH = common and king eider hens in singles and flocks.² CEJV = common eider juvenile.

Table 3. Total birds for all areas, ACP coastline, 24-27 June 2005.

Species	Mainland	Barrier Isl.	Total
AMWI	2		2
ARTE	635	19	654
BLBR	1762	81	1843
BLGU	1		1
BLKI	3		3
BLSC	35		35
CAGO	749	45	794
CEJV ²	2		2
COEH ¹	49	11	60
COEI	1878	641	2519
GLGU	3430	529	3959
GRSC	602		602
KIEH ²	24		24
KIEI	786	227	1013
LGSH	2		2
LTDU	3544	428	3972
NOPI	543	10	553
PAJA	5		5
PALO	145	21	166
RBME	444	51	495
RTLO	68	13	81
SAGU	76	7	83
SMSH	8		8
SNGO	422	352	774
SNOW	12	3	15
SPEI	18		18
STEH ¹	6		6
SUSC	2672	548	3220
TUSW	80	3	83
WFGO	454		454
WWSC	1228	7	1235
YBLO	23		23

¹ COEH, KIEH, STEH = common, king and Steller's eider hens in singles and flocks.

² CEJV = common eider juvenile.

Table 4a. Common eider sex and age composition and totals in shoreline segments, ACP, 2005.

SEGMENT	SINGLES		PAIRS		TOTAL JUVENILES	FLOCKED BIRDS		TOTAL ³
	Adult Male	Female	No.	Indicated Total ¹		Total	Male:Dark Birds ²	
1	1		6	7				13
2	9	1	18	27	1	27	0:2	74
3	2	1	2	4	1	18	11:24	26
4	47		52	99		77	30:47	228
5	33	2	70	103		27	11:16	202
6	22	1	9	31				41
7	26	1	27	53		12	10:2	93
8			1	1				2
9								0
10	13	1	29	42		9	7:2	81
11			1	1				2
12								0
13								0
14								0
15			1	1				2
16								0
17								0
18								0
19								0
20	4		7	11		4	0:4	22
21	13		13	26		20	4:16	59
22	77	1	72	149		180	158:22	402
23			4	4		150	75:75	158
24	35		13	48				61
25	63		11	74		53	23:11	144
26	20	1	10	30		35		76
27								0
28			1	1		70	53:17	72
29	50	1	21	71		78	58:20	171
181								0

¹ Single males+pairs = Indicated total pairs.

² Flocks from which sex ratios were obtained. Dark birds = females and subadults.

³ Total= singles+2x pairs+ juveniles+ flocks.

Table 4b. Common eider sex and age composition and totals in barrier island segments, ACP, 2005.

SEGMENT	SINGLES		PAIRS		TOTAL JUVENILES	FLOCKED BIRDS		TOTAL ³
	Adult Male	Female	No	Indicated Total ¹		Total	Male:Dark Birds ²	
190	1			1				1
191								0
192	7		2	9				11
193	3			3				3
194								0
195			1	1				2
196	7	2	2	9				13
197	16	1	1	17				19
198	45	1	10	55				66
199	101		36	137		193	14:11	366
200	5		6	11				17
201	12			12				12
202	12		2	14				16
203								0
204	1	1		1				2
205	3		6	9				15
206	15	1	3	18		20	14:6	42
207	2			2				2
211	27			27		25		52
212	8		1	9				10
213	3			3				3
214								0

¹ Single males+pairs = Indicated total pairs.

² Flocks from which sex ratios were obtained. Dark birds = females and subadults.

³ Total= singles+ 2x pairs+ flocks.

Table 5. Proportional distribution of totals and indicated pairs of common eiders along the ACP, 1999-2005

AREA (Segment No.)	1999 (%)		2000 (%)		2001 (%)		2002 (%)		2003 (%)		2004 (%)		2005 (%)	
	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs	Total	Pairs
Kasegaluk Lagoon (2-7)	176 (13.0)	69 (12.1)	914 (34.5)	119 (13.8)	747 (26.3)	165 (24.4)	1802 (40.5)	177 (21.0)	657 (31.0)	171 (19.6)	1553 (51.2)	414 (30.9)	664 (25.7)	317 (28.3)
Peard Bay (10)	106 (7.8)	36 (6.3)	7 (0.3)	1 (0.1)	288 (10.2)	73 (10.8)	258 (5.8)	83 (9.9)	121 (5.7)	67 (7.7)	109 (3.6)	48 (3.6)	81 (3.1)	42 (3.7)
Central Beaufort Sea Coast (18- 21, 181-214)	542 (40.1)	378 (66.1)	760 (28.7)	424 (49.1)	531 (18.7)	277 (41.0)	1347 (30.3)	350 (41.6)	647 (30.5)	331 (37.9)	784 (25.8)	512 (38.2)	733 (28.4)	375 (33.5)
Canning R.- Demarcation Bay (22-29)	299 (22.1)	75 (13.1)	956 (36.1)	319 (37.0)	1242 (43.8)	158 (23.4)	1005 (22.6)	224 (26.6)	476 (22.4)	267 (30.5)	523 (17.2)	341 (25.4)	1084 (42.0)	377 (33.6)
Other areas (1, 8-9, 11- 17)	230 (17.0)	14 (2.5)	12 (0.5)	0	29 (1.0)	3 (0.4)	37 (0.8)	7 (0.8)	222 (10.4)	38 (4.3)	64 (2.1)	25 (1.9)	19 (0.7)	10 (0.90)
TOTALS	1353	572	2649	863	2837	676	4449	841	2123	874	3033	1340	2581	1121

Table 6. Species totals for all areas, ACP, 1999-2005.

Species	Total Birds Observed						
	1999	2000	2001	2002	2003	2004	2005
AGWT	0	0	0	6	0	0	
AMWI	0	0	0	0	0	10	2
ARTE	901	127	1530	241	671	1628	654
BLBR	2329	1411	2215	1319	2656	3836	1843
BLGU	1	8	18	9	823	4	1
BLKI	0	0	29	92	0	15	3
BLSC	3	0	0	546	0	14	35
CAGO	1554	659	465	425	823	577	794
CEJV ¹	18	8	10	0	0	30	2
COEH ²	92	330	295	215	114	88	60
COEI ³	1243	2311	2532	4234	2009	2915	2519
COLO	0	0	1	0	2	0	2
COMU	0	0	0	40	0	0	0
COME	0	0	4	0	0	0	0
CORA	0	0	1	2	2	1	0
GLGU	4462	3345	5499	2703	7031	5478	3959
GRSC	1011	944	744	99	495	408	602
GYRF	0	0	0	0	0	1	0
JAEG	0	12	0	0	1	4	0
KEJV ¹	0	0	0	0	0	1	0
KIEH ²	9	61	48	146	35	37	24
KIEI	892	427	1716	10719	5334	2327	1013
LGSH	0	0	0	0	7	0	2
LTJA	1	3	0	0	1	5	0
LTDU	4890	5726	5544	5110	9724	3527	3972
MEGU	0	0	8	21	0	0	0
MESH ⁴	0	0	62	0	0	0	0
NOFU	0	0	0	1	0	0	0
NOPI	1268	779	2752	516	879	751	553
PAJA	4	9	81	7	10	3	5
PALO	443	429	208	537	325	315	166
POJA	0	3	0	0	4	0	0
RBME	710	1985	194	108	265	643	495
RTLO	85	198	154	64	233	159	81
SACR	2	2	2	2	1	0	0
SAGU	99	4	442	20	185	106	83
SMSH ⁴	0	3	0	0	0	4	8
SNGO	124	986	192	164	454	468	774
SNOW	14	0	1	6	4	0	15
SPEH ²	2	0	0	0	0	1	0
SPEI	11	15	45	14	8	13	18
STEI	0	0	2	1	0	0	0
STEH ²	0	0	0	0	0	0	6
SUSC	2073	11113	2644	1500	5764	1543	3220
TUNE ⁵	9	0	0	1	1	0	0
TUSW	32	84	30	269	49	50	83
WFGO	521	1269	623	425	255	1411	454
WWSC	128	765	1622	1485	931	1159	1235
YBLO	40	51	40	34	48	91	23

¹ CEJV, KEJV = COEI and KIEI juveniles in singles and flocks.² COEH, KIEH, SPEH, STEH = common, king, spectacled or Steller's eider hens in singles and flocks.³ COEI = single adult males and birds in pairs and flocks.⁴ MESH = medium shorebird; SMSH = small shorebird.⁵ TUNE = tundra swan nest.

Table 7. Common eider flock composition along the coastline of the Alaska ACP.

Year	Flock Total	Total Classified	Adult Males	Brown Birds ¹	Ratio ²
1999	546	351	129	222	0.6:1
2000	1469	1191	613	578	1.1:1
2001	1785	1546	930	616	1.5:1
2002	3083	2423	1533	890	1.7:1
2003	815	363	189	174	1.1:1
2004	1033	991	665	326	2.0:1
2005	998	743	468	275	1.7:1

¹ Brown Birds = Females and Subadults.

² Adult Male:Brown Birds.

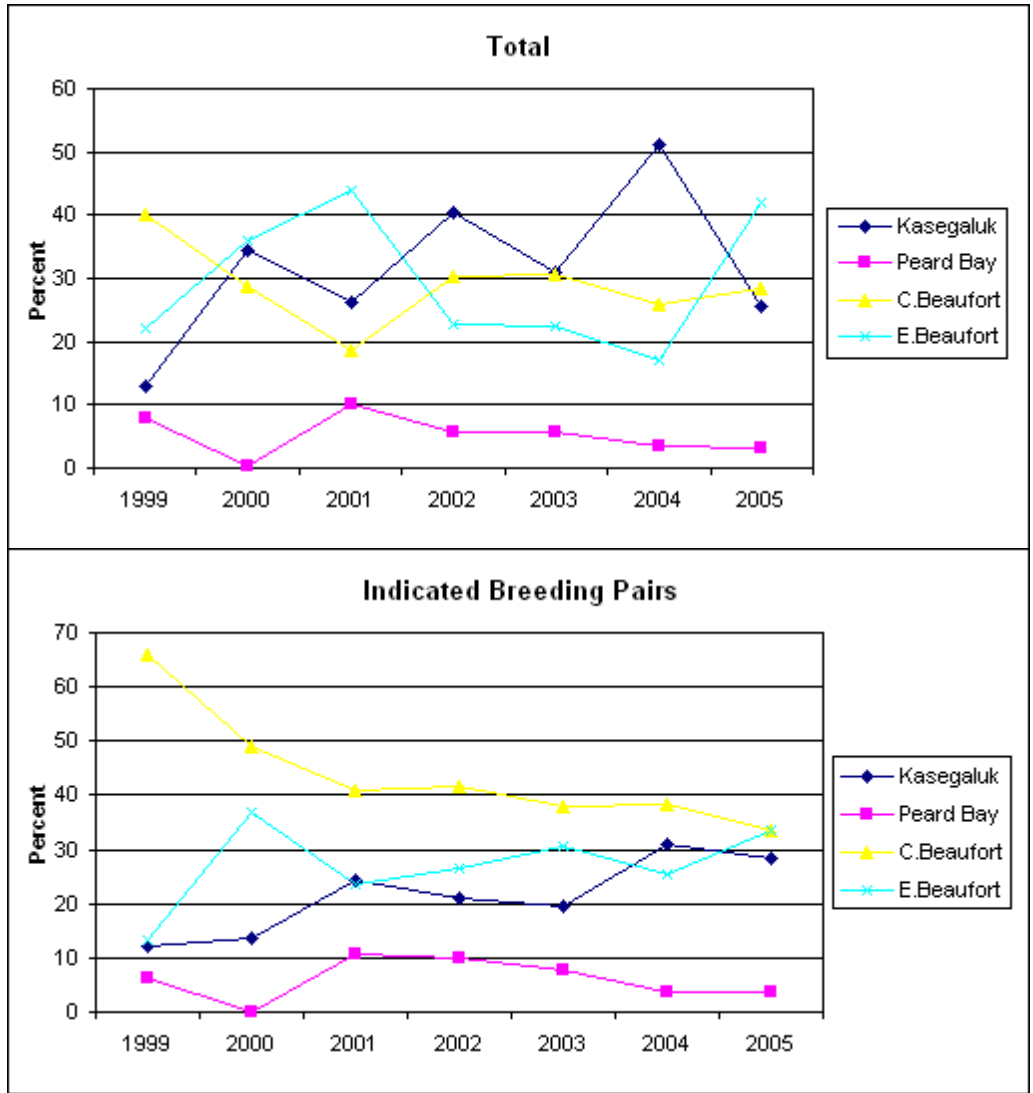


Figure 4. Trends in percent distribution of total and indicated breeding pairs of Common Eiders.